ORIGINAL ARTICLES

THE ESSENTIALS OF SURGICAL DIAGNOSIS WITH REFERENCE TO FRACTURES.*

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It is obvious that end results associated with fracture treatment give quite too large a percentage of faults, deformities and impaired function. Such conditions take a wide range between moderate shortening, slight angularity and alteration of axial relations; to non-union, positive limp, persistent pain and joint ankylosis of varying extent.

In the conduct of fracture cases, the first exaction is to determine, as accurately as may be, the nature of the lesion and to weigh its importance from the standpoint of immediate requirement. But though the lesion be never so obvious and the necessity of immediate attention be clearly urgent, the attendant is, at once, confronted by the more laborious task of perfecting a diagnosis at the earliest possible moment. Routine steps having been taken to insure the patient's comfort and safety, a painstaking review of every feature of the case becomes a matter for serious consideration. First impressions must be revised, early opinions are to be checked up and perhaps abandoned, while collateral or pre-existing conditions are to be recognized and their full value assigned.

At this juncture, immense advantage is to be derived from a carefully written case history, and it may be said that a clear perspective of a clinical picture cannot be acquired and made available without it. In this undertaking a well-defined scheme should be followed scrupulously. During the early hours of an undertaking a mere skeleton should be formulated; this to be rewritten and fully developed, when convenient. Every collateral detail should be worked out and recorded, and no incident having a bearing upon the case, should be omitted. By this means, opportunity is afforded for the correction of errors of commission, while errors of omission, often the forerunner of disaster, are avoided and the patient's welfare conserved in large measure. Even in injuries of lesser magnitude, a written record is often of great value where later developments pointing to occult conditions become ultimately manifest. As a matter of personal discipline, it will be found that the surgeon, himself, derives an appreciable advantage from the careful study of routine cases from this point of view.

While in certain cases a permanent abnormality is inevitable, being inherent in the given lesion, it is nevertheless beyond question that some of the humiliating incidents springing from broken bones can be modified or entirely obviated, by an accurate knowledge of initial conditions. Joint fractures, notably those of the elbow and ankle, are clearly in evidence, while obdurate, complicated fractures of long bones are of frequent occurrence.

There is a growing sentiment among surgeons, and to a certain extent among the laity, which stands for anatomical reposition, or a close approximation thereto, as the criterion for fracture treatment. Moreover, emphasis should be laid upon the fact, that in exact ratio as the standard for results becomes elevated, the surgeon's moral and legal responsibility is augmented.

If this doctrine be accepted, the logical exaction is for a diagnosis which is beyond question at the outset, and which can be verified during the process of repair.

Is this a reasonable exaction for the routine work of the average surgeon? If this query be affirmed, it is clearly manifest that the attitude of attendants must conform to the added burden thereby imposed. Any policy that suggests or tolerates time-serving or chance-taking must be abandoned and all the sidelights afforded by official aids or methods of precision must be thrown upon the situation.

The natural inference is that the mere discovery of a broken bone and the recognition of deformity or of various complications is but an introduction to the greater task. The genius of diagnosis lies in such interpretation of the pathology of the lesion as will suggest a rational policy for relief; and it may be added that the best validation of a diagnosis is the nearest possible approach to an ideal result.

In recent years, the X-rays have simplified the work of fracture diagnosis and it is a matter of some little surprise that an aid so nearly infallible is not appealed to more frequently. But more surprising is it, that there are those who still insist that the radiogram is positively misleading and unreliable. It seems probable that this belief springs from inexperience as regards technic or interpretation.

It is generally understood that no X-ray investigation is adequate until opportunity for inspection of pictures through two or more planes is afforded and it is an oft-repeated experience, that a marked displacement of fragments may escape detection in a single plane picture.

An expert radiographer was recently severely criticized because a first radiogram (taken under the surgeon's orders) showed perfect alignment in a Colles' fracture, while a second through the lateral plane, taken a few days later, indicated a startling deformity. An appended statement was to the end that the second picture showed a condition that did not exist.

Correct interpretation of shadow pictures is a matter of considerable moment, occasionally calling for an exercise of artistic discrimination that comes

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only with long training. In complicated fractures, it happens not infrequently that multiple lines are obscured or wholly hidden, and the outlines of fragments are hopelessly confused with joint interspaces. In such a contingency valuable aid is to be derived by the study of a picture of the opposite normal member. For this purpose, most X-ray laboratories maintain a more or less complete collection of well executed radiograms of joint structures, but there are, now and then, problems in fracture diagnosis which remain unsolved after exhausting every available resource including the X-ray. In the presence of the usual signs such as crepitus, abnormal mobility, deformity and overriding, with fracture lines and displaced fragments clearly indicated by the skiagram, repeated and conscientious effort at replacement fail, or after more or less satisfactory reduction, permanent fixation, by conservative means, is found to be impossible.

Two cases illustrating this point have been recently observed. The first was an oblique fracture of the tibia with associated fracture of the fibula. Under ordinary manipulation, the fragments seemed quite readily to resume fairly normal relations, but upon adjustment of splints, the deformity was found to have recurred. Again under ether, a strenuous effort was made to reach a satisfactory solution with a similar result. During a later operation, the cause of the difficulty was discovered, in a small, incarcerated fragment, which hung suspended between the fracture surfaces, over which sliding and displacement were inevitable.

Another case was that of a fracture of the femur in the middle third. Having frequently employed pulley traction to aid in reduction of deformity during operative procedure, I determined to resort to this plan in the hope that it would enable us to avoid resort to the open method. Accordingly, under full anesthesia, pulley traction was applied, as much force being used as seemed safe. During this process, the fragments were manipulated and adjusted and to my mind, replacement seemed assured. The alignment was apparently perfect and through the thick thigh muscles, I could detect no irregularity suggesting overriding. With traction still exerted, anesthesia being continued, an X-ray negative was taken to determine officially the exact status of affairs at that moment. Imagine my surprise at finding later that at no time had replacement been secured. These two experiences, occurring in rapid succession as a part of daily routine, will find manifold duplication in fracture treatment everywhere. They sharply accentuate the fallacy of implicit reliance upon tactile sense or even the X-ray in determining the relation of fragments, or the exact cause of displacement.

In such an exigency, having exhausted every resource, there would appear to be the best of reasons for a resort to a diagnostic incision as in dealing with many conditions affecting the abdominal viscera.

Speaking for those who are in accord with the idea of operative treatment of recent fractures, this doctrine will meet with no protest and I need only suggest that in this field, the transition from the old to the new is not more abrupt nor more startling than that which is manifest in undertakings which have become a matter of daily routine.

Discussion.

Dr. W. I. Terry, San Francisco: I am in accord with the statements made by Dr. Huntington and I have some photographs which illustrate the reposition of bad fractures by operative measures. The whole story is told in these pictures.

Dr. Frank Rattan, Martinez: It seems to me that this subject will become a very important medico-legal point. Dr. Huntington is a very able surgeon and has every appliance possible to make these operations. When I am called out into the country, however, and have nothing but a jack-knife with which to operate, and am then sued for malpractice, and Dr. Huntington is called in as an expert witness, he will say that I did not do right. I suppose that we ought to send these cases down to Dr. Huntington, but I would like to ask Dr. Huntington what we in the country shall do with our fractures of the thigh.

Dr. Karl Kurtz, Los Angeles: I think that where it is impossible to make the diagnosis with the tactile sense and with the X-ray, it is probably advisable to make the diagnostic incision. I recall a case in Pasadena which came into my office in which the diagnosis had been made of dislocation of the shoulder joint. On examining this case the history stated that the head of the bone had been replaced, and the patient further stated that two or three weeks after the injury he had felt something snap and the physician had told him that he had a second dislocation. I examined and found a shortening of the humerus at least 1". I had an X-ray picture taken which confirmed the diagnosis. There might be a possibility in these injuries of not being able with the ordinary examination to make a diagnosis, and I presume that the diagnostic incision would be of value in such cases. I do not think, however, that it would be a good plan for every surgeon or physician to make a diagnostic incision for the simple reason that they are so apt to get infection.

Dr. Edward T. Dillon, Los Angeles: This paper was particularly interesting to me, as I have a great number of fractures in my work in Los Angeles. The point made of taking both the anterior posterior and lateral views of Colles' fractures is an excellent one. Sometimes one view shows the bones to be perfectly aligned, while another made in a different plane shows them imperfectly so. When good apposition of the fragments cannot be obtained I am sure that surgical interference is indicated.

Dr. T. W. Huntington, closing the discussion: The question asked by Dr. Rattan is certainly a proper one, as it is not within the possibilities that every man who is called upon to treat fractures can be expected to study them with the X-ray or to operate in those cases which seem to require operative treatment. In these instances, I should say that a carefully written record is a surgeon's best protection. If it be not possible for the patient to be transported to a point where operation can justifiably be undertaken, the patient should be made fully aware of this fact, and furthermore, should be told that without operation only a tolerable result could be anticipated. If all this be made a matter of record the surgeon need feel no anxiety as to the future attitude of the patient from a medico-legal standpoint.